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Numerical simulation of electroionisation and electric-discharge gas flow CO lasers

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Abstract

An effecient method is developed for numerical investigation of gas flow electric-discharge and electroionisation CO lasers. The model includes a set of vibrational kinetic equations, the equation for the electron energy distribution function, and radiative gas-dynamics equations. The proposed method is based on the splitting of the system of equations into several subsystems corresponding to different physical processes (splitting method). Populations of vibrational levels, the gains, the emission line intensities, the output power, and the efficiency of CO lasers are calculated and compared with the experimental data.

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Keywords

CO laser, Gain, Lasing spectrum, Vibrational levels